REMARKS

The 35 U.S.C. §112 problems in claims 409 and 417 are avoided by the amendments herein.

The Examiner rejects claims 337-342, 356, 383,385, 403, and 408-421 under 35 U.S.C. §102(b) as anticipated by Pernick. The Examiner rejected claims 343-355, 357-382, 384, 386-402, and 404-407 under 35 U.S.C. §103 as unpatentable over Pernick.

The Examiner acknowledges that Pernick does not disclose anything about engraving cups in a processing surface. However, the Examiner contends that the prior art structure of Pernick is capable of performing the intended use and therefore it meets the claim language. In support of this, at page 3 of the Office Action the Examiner contends that the emerging laser beam disclosed by Pernick will necessarily have a power and energy density high density high to be capable of eroding a material and thus forming cups. However, this is not the case as explained hereafter. Pernick clearly teaches he not have the power density and energy sufficient to erode the material to form cups and therefore the rejection of all the claims should be withdrawn. Furthermore, Pernick teaches away from surface erosion.

Applicant relies on three separate and independent arguments, each of which by itself is sufficient for withdrawal of the Examiner's rejections.

First, all of Applicant's claims 337-421 require engraving cups in a processing surface by eroding material from the processing surface. This cannot be inherent in Pernick and the prior art structure of Pernick cannot be capable of erosion to form cups, since Pernick teaches directly away from erosion. Pernick teaches that his laser beam is to imping on an optical detector to create electrical signals. It is clear

Received from < > at 11/3/03 2:06:53 PM [Eastern Standard Time]

to those skilled in this art that you do not erode the surface of an optical detector to form cups in that surface. To do so would destroy the optical detector. Rather, Pernick would teach the opposite of eroding cups in the surface of the optical detector, since the only intent in Pernick is to convert light to electrical signals and thus the surface of the optical detector should remain smooth and not be damaged. To damage the optical detector by forming cups in the detection surface thereof would defeat the object of Pernick. Therefore Pernick teaches away from the formation of cups in the surface of an optical detector and cannot possibly be an inherent teaching of Applicant's invention.

One must look <u>at the entire teaching</u> of a reference and not segregate out one portion to the exclusion of another important related portion of that reference which teaches away. What is critical is what Pernick teaches as a whole. Thus the optical detector in Pernick cannot be separated from the laser beam impinging on that detector.

Secondly, Applicant's claims 385, 406, 408, 409, 410, and 417-421 recite a printing form and claims 406, 408, 409, 410, and 417-421 recite a copper surface printing form.

In order to engrave cups in a printing form, and particularly a copper surface printing form, the following is noted in Applicant's Second Substitute Specification. At page 8, lines 8-12, for a printing form engraving in copper, an energy of 165 mWsec is required for copper, and as further stated:

> "Lasers having <u>a continuous-wave performance of several kilowatts given good beam quality</u> are thus required in order to produce cups in copper with a speed that is accessible for the printing industry."

Received from < > at 11/3/03 2:06:53 PM [Eastern Standard Time]

Also of significance is the disclosure at page 9 beginning at line 26 through page 10 line 5 citing the publication "The Laser in the Printing Industry" which indicates that high power density is required for processing the materials:

> "Given power densities of typically above 10^7 through 10^8 W/cm^2, a spontaneous evaporation of the material occurs in all materials, this being accompanied by a sudden absorption rise, which is especially advantageous since the laser power is then no longer reflected from the metal surface. When, for example, a laser source of 100 W is available, then the processing spot diameter may not be larger than 10 μm in order to arrive at these values in the region, as proceeds from the following equation: 100 W: (0.001 cm x 0.001 cm) = 10^8 W/cm^2."

At page 11, line 24 it is pointed out that the exit of the fiber laser supplies radiation focused onto less than 10 μm diameter (relevant to claim 413). This results in an extremely high power density.

This kind of high power density necessary to erode cups in a metal printing form in an engraving machine would destroy the Pernick detector 34 shown in Fig. 3 where the laser beams are focused down to a spot onto his light detector. As disclosed at column 1, lines 45-49 and column 2, lines 65-68 of Pernick, the beams 32 are focused on the detector 34 and the detector output represents the correlation of the input information with the image stored in the filter 26. It is thus very clear to one skilled in the art that the detector 34 is merely an optical detector for converting light intensity impinging on the detector surface into electrical signals corresponding to that light intensity. It is well known to those skilled in the art that optical detectors typically have a plastic covering surface on which the light impinges which certainly has a lower melting point then a <u>metal</u> surface of a printing form, such as made of copper. The power density required to erode away a metal cup would easily melt and erode the surface of the light detector and rend r it useless. Therefore, clearly the power and energy density of the laser beams focused onto the optical detector

Received from < > at 11/3/03 2:06:53 PM [Eastern Standard Time]

34 does not have a sufficient power density necessary for eroding away metal on an engraving machine printing form.

The third independent basis by which at least claims 385, 406, 408, 409, 410, and 417-421 distinguish over Pernick can be explained as follows. At column 3, lines 40-47, it is disclosed that the fiber optic lasers of Pernick are optically pumped by component 210; and the pumping arrangements for the optical pump 210 in Figure 4 of Pernick are disclosed in the publication "Fiber Technology Ushers in New Laser Devices". A copy of that publication is enclosed. In that article, Figure 1 shows the fiber laser cavity configuration having a pump which pumps light into the fiber optic laser, which then outputs laser light. The fiber laser pump source is described at page 232, middle of the right hand column as being a single mode semiconductor laser available in powers up to 150 mW. Therefore, the optical pump 210 in the Pernick reference is disclosed as having a <u>maximum</u> power of 150 mW. This optical pump power is <u>then divided</u> between a total of "n" fiber lasers 104. Thus, each fiber laser 104 in Pernick receives only a fraction of the 150 mW power for its pumping. As disclosed at page 234, middle of the right hand column, with such a 150 mW pump light input, fiber lasers may have an output power of 1/2 to 4 watts. But since in Pernick the optical pump have a 150 mW power rating is shared among "n" fiber optic lasers 104, the power from each fiber optic laser 104 is only a fraction of this 1/2 point to 4 watts and probably less so that the combined laser beams at focus 32 will not melt the surface of the detector 34 and destroy it. It is thus clear that the power density achieved at the focal point 32 impinging on the detector 34 in Pernick is nowhere near the several kilowatt laser power and power density of 10^7 through 10^8 W/cm^2 necessary to erode cups in a metal surface of an engraving machine printing form.

Received from < > at 11/3/03 2:06:53 PM [Eastern Standard Time]

Finally, it is further noted that the single mode laser diodes of th type described in the "Laser Focus World" article even in 1998 had a maximum power output of only 200 mW. See, for example, the 1998 Semiconductor Laser Product catalog attached.

In view of these three independent arguments, it is respectfully requested that the Examiner withdraw the rejection under Section 102 and Section 103 and allow the claims pending in the present case.

Respectfully submitted,

(Reg. #27,841)
Brett A. Valiquet
SCHIFF HARDIN & WAITE
Patent Department
6600 Sears Tower
Chicago, Illinois 60606
Telephone: 312-258-5786
Attorneys for Applicant
CUSTOMER NO. 26574

CHI\4067308.1

Received from < > at 11/3/03 2:06:53 PM [Eastern Standard Time]